EPRI | ELECTRIC POWER RESEARCH INSTITUTE

COMMENTS OF THE ELECTRIC POWER RESEARCH INSTITUTE ON

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 30

[EPA-HQ-OA-2018-0259; FRL-9977-40-ORD]

Strengthening Transparency in Regulatory Science

August 7, 2018

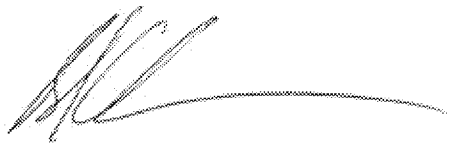
The Electric Power Research Institute, Inc. (EPRI) respectfully submits the enclosed comments on the U.S. Environmental Protection Agency's (EPA's) proposed rule titled *Strengthening Transparency in Regulatory Science*. EPRI appreciates the opportunity to comment on this rule.

EPRI is a nonprofit corporation organized under the laws of the District of Columbia Nonprofit Corporation Act and recognized as a tax-exempt organization under Section 501(c)(3) of the U.S. Internal Revenue Code of 1986, as amended, and acts in furtherance of its public benefit mission. EPRI was established in 1972 and has principal offices and laboratories located in Palo Alto, Calif.; Charlotte, N.C.; Knoxville, Tenn.; and Lenox, Mass. EPRI conducts research and development relating to the generation, delivery, and use of electricity for the benefit of the public. As an independent, nonprofit organization, EPRI brings together its scientists and engineers as well as experts from academia and industry to help address challenges in electricity, including reliability, efficiency, health, safety, and the environment. EPRI also provides technology, policy and economic analyses to inform long-range research and development planning, as well as supports research in emerging technologies. As a tax-exempt research organization, EPRI makes its research results widely available to the interested public through license, purchase or other dissemination.

These comments on the proposed rule reflect EPRI's opinions derived from its research and development experience over the last 40 years in the field of human health effects. In particular, EPRI has robust research programs investigating exposure- or dose-response questions of relevance to the electric power industry and its stakeholders, including criteria air pollutants, trace metals and organic compounds, low dose ionizing radiation, and electromagnetic fields. These comments reflect EPRI's research activities in that they are technical rather than legal in nature. The enclosed comments reflect only EPRI's opinion and expertise and do not necessarily reflect the opinions of those supporting and working with EPRI to conduct collaborative research and development.

EPRI hopes its comments and technical feedback will be valuable to EPA.

Sincerely,



Robert Chapman
Vice President, Energy and Environment

COMMENTS

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 30

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Strengthening Transparency in Regulatory Science

Submitted by:
ELECTRIC POWER RESEARCH INSTITUTE
3420 Hillview Avenue
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August 7, 2018

INTRODUCTION:

The Electric Power Research Institute, Inc. (EPRI) respectfully submits the enclosed comments on the U.S. Environmental Protection Agency's (EPA's) proposed rule titled *Strengthening Transparency in Regulatory Science*. EPRI appreciates the opportunity to comment on this rule.

EPRI has robust research programs investigating exposure- or dose-response questions of relevance to the electric power industry and its stakeholders, including criteria air pollutants, trace metals and organic compounds, low dose ionizing radiation, and electromagnetic fields. EPRI's research in the area of human health effects spans more than 40 years.

The proposed rule focuses on dose-response data. Such data can be generated in *in vitro* or *in vivo* toxicological studies, controlled human exposure studies (also termed clinical studies), and observational epidemiology studies in humans. In the case of toxicological data, making information publicly available is generally straightforward. However, human data present unique challenges due to privacy and confidentiality. Detailed study protocols are required that outline steps that will be taken by the researchers to protect confidential information, and in any study involving humans, approval by an Institutional Review Board (IRB) is required. An IRB

is a committee that evaluates the ethics of a given research endeavor, with the goal to protect human subjects from any physical or psychological harm. Universities and other research organizations cannot conduct research that involves human subjects without IRB approval.

EPRI understands the importance of transparency in scientific research, and supports efforts to make datasets available for use by the scientific community to the extent possible. For example, EPRI has funded an extensive air quality monitoring campaign – the Southeastern Aerosol Research and Characterization Study (SEARCH) – for more than a decade (see Hansen et al., 2003 for a description). This rich dataset includes detailed daily data from multiple sites on criteria pollutants, PM components, volatile and particle-phase organic compounds, and pollen and mold spores, over varying time periods. The data have been utilized in more than 300 peer-reviewed articles, including multiple time-series epidemiological analyses, and are available free of charge at https://www.dropbox.com/sh/o9hxoa4wlo97zpe/AACbm6LetQowrpUgX4vUxnoDa?dl=0. In fact, EPRI encourages use of these data by the broader community as EPRI believes they are a tremendous resource for both physical and health sciences researchers.

EPRI conducts research in the public benefit. To this end, EPRI supports efforts to improve transparency and to allow the best science to be used to protect public health and the environment. This includes transparency in dataset availability, methodologies, models, and other aspects of scientific research. In the past, EPRI has commented on a variety of regulatory activities along these lines, including recent comments encouraging transparency in modeling of the social cost of carbon (e.g., EPRI, 2014a; 2014b).

More specifically, to achieve EPRI's public benefit mission, it is vital that EPRI be able to provide its research results to inform regulatory discussions, such as those with the EPA and other stakeholders. In many studies, EPRI employs data originating from publicly available sources. However, some of EPRI's work involves data that may not be publicly shared, including proprietary material from member companies and other collaborators, data that EPRI must purchase or obtain through special arrangements to facilitate research, personally identifiable information (PII), and data that are classified because of national security considerations. As such, EPRI has two primary comments on the proposed rule. The first focuses on the objective of providing sound scientific input to ensure that standards, rules, and other regulatory actions are scientifically defensible and are health-protective while minimizing cost. EPRI will provide examples of its past, existing, and future work to illustrate how the rule may impact the utilization of such scientific input to inform these aspects of the regulatory process. EPRI's other comment focuses on the alternative dose-response models referred to in the proposed rule. EPRI also has six questions and issues for clarification.

COMMENTS:

1. **Confidential/Personal Health Information:** EPRI has funded, is funding, and plans to fund a number of studies involving primary data used in epidemiological analyses evaluating dose-response relationships. These data can consist of exposure information as well as individual-level health outcome information. In some cases, EPRI-funded researchers collect data directly (e.g., panel epidemiology studies), and EPRI would typically own the collected data. In other cases, however, EPRI-funded research involves the use of datasets owned by other institutions, which EPRI obtains through permissions or, at times, licenses. And in other studies, EPRI purchases access to data from a third party, subject to stringent license terms and use thereof limited to specific purposes under strictly controlled conditions.

   Given that the proposed rule requires data to be publicly available "in a manner sufficient for independent validation", this may present a challenge for a number of these studies to the detriment of the public if they are excluded from consideration. Complete exclusion of an entire study could limit access to scientifically defensible information to regulators and other stakeholders to achieve desired regulatory aims. EPRI research cannot inform deliberations on proposed regulation or provide new learning to EPA if the study cannot comply with the requirements of the proposed rule given the placement of undue burden on the study investigators to provide required documentation (e.g., redacted death certificates in cohort mortality studies), complete additional IRB applications, or submit additional applications to other originators of data for permission to share publicly. An unintended outcome of the rulemaking could be elimination from consideration of not only EPRI's but also other past, present, and future research that could be useful to regulators and other stakeholders.

   Examples of past and current research that EPRI believes are important for consideration in regulatory activities are described below (note that this is not an exhaustive list.) Each example provides an explanation of the potential issues associated with making data required to understand human health effects and dose-response relationships publicly available.

   a) *Medicare Cohort Study to Understand Air Pollution Health Effects*: EPRI has funded the purchase and analysis of a large Medicare beneficiary dataset to investigate important questions related to air pollution health effects (Pun et al., 2017; Eum et al., 2018; additional papers forthcoming). Analyses of this dataset are expected to continue into the future. The health outcome data (mortality) were obtained from the Centers for Medicare and Medicaid Services (CMS) via a costly, labor-intensive, and protracted process. Deidentification of these data to a form that would be acceptable for sharing by CMS would preclude their use in meaningful air pollution epidemiological research. This is because identifying information such as the ZIP

codes of residence is required to assign pollutant exposures, and identifying information such as age, gender, and race is required to allow adjustment for these factors in epidemiological models.

The proposed rule also mentions data research centers that facilitate secondary data usage by the public. If the CMS data are considered to fall in this category, EPRI would encourage EPA to work with CMS to streamline and simplify the data acquisition process and make the data available to the public free of charge. Otherwise, the cost and security requirements of obtaining these data may place an undue burden on stakeholders seeking to replicate analyses, since the data for EPRI's project were acquired at a significant cost (> $100,000) and a comprehensive data management plan that outlined rigorous security protocols was required. Clearly, these requirements would make replication of the work untenable for many researchers. EPRI has concerns that the challenges of making these data available in an equitable fashion may result in the data and insights from this study being removed from consideration in standard-setting activities for $PM_{2.5}$, ozone, and NO_2.

b) *Occupational Epidemiology Study of Hexavalent Chromium Cancer Risk*: EPRI funded a study to update the mortality, exposure reconstruction and dose-response modeling for a cohort of workers from the Painesville, Ohio Chromate Production Plant who were exposed to hexavalent chromium, resulting in elevated rates of lung cancer (Proctor et al., 2017). This cohort is associated with significant regulatory precedent as it updated a study used by the Occupational Safety and Health Administration for risk assessment when the hexavalent chromium Permissible Exposure Limit was lowered in 2006. The current EPA inhalation cancer slope factor, originally set in 1984, was also based on an earlier study of workers from the Painesville plant, but the EPRI study uses more robust data and included short-term workers, thus allowing examination of the dose-response relationship in the low-exposure range.

Clearly this study is of interest for risk assessment (in particular, the EPA's Integrated Risk Information System [IRIS] program); however, the original data are not publicly available as they are owned by the company that employed the workers, and EPRI's research was subject to a strict confidentiality agreement. EPRI believes it could be possible to prepare a publicly available analytical file that provides individual-level deidentified data with dose measures for each unidentified cohort member, with the occurrence of lung cancer, the occurrence of significant covariates used in the model (e.g., smoking), approximate date of birth (e.g., birth year in a 2-year range)

and other variables needed to calculate expected number of deaths (race, gender and approximate date of death, within a range). However, whether or not the file is ultimately made publicly available would depend on the availability of resources to create the file, likely permission from the data owner to distribute the information, even in its deidentified form, and possibly an additional IRB application. If these requirements were met, the information could be used to reproduce the published dose-response model without violating agreements with the original IRB's approval of the study or agreement with the Centers for Disease Control (CDC) for use of National Death Index (NDI) data. However, complete study validation, as expressed in the proposed rule (i.e., data to be publicly available *in a manner sufficient for independent validation*), would not be possible. The raw data required to reconstruct exposures or identify causes of death are not sharable because the information is protected (due to ownership by the employer). To reconstruct the cohort-specific Job Exposure Matrix, inclusion of PII regarding the work history, including job titles over time as well as starting and termination dates, is needed. This information could not be made publicly available without disclosing PII. Also, it is not possible to provide the raw data to reconstruct the outcome (lung cancer death occurrence in this case). In some cases, cause of death was identified by death certificate, which could be redacted, although with significant effort by the researchers; however, NDI data were destroyed upon completion of the study, consistent with the agreement that the Centers for Disease Control (CDC) had with the researchers for use of the data. Thus, to recreate those raw data, significant PII would be required to search the NDI records again. This would not only be extraordinarily time-consuming and costly but would have to be approved by CDC and would require a new IRB review and approval. EPRI is concerned that this important study, which reported a different inhalation cancer slope factor for hexavalent chromium as compared with previously published studies, would be eliminated from consideration in the IRIS process or other proceedings in which toxicity factors are determined.

c) *Children's Air Pollution Asthma Study (CAPAS)*: EPRI funded a panel study of asthmatic children involving residential exposure assessment and collection of pulmonary function and symptom data. Several papers resulted from the research related to the associations between indoor and outdoor $PM_{2.5}$ and its individual components and asthma exacerbation (Habre et al., 2014a, 2014b; Rohr et al., 2014; Schachter et al., 2015; additional paper forthcoming). The consent form utilized in the study stated that indoor exposure data as well all questionnaire data would be kept strictly confidential. This would preclude the consideration of all data from this study with the exception of the ambient monitoring data which were obtained

through a combination of a state-operated monitoring network and an EPRI-funded fixed monitoring site. EPRI is concerned that this body of research would be eliminated from consideration in standard-setting activities. Additionally, CAPAS provided important information on the role of PM components in the health effects, which is a topic of interest to EPA and others, given that it is unlikely that all PM components are equally toxic.

d) *Low Dose Radiation Exposure Health Effects*: EPRI has for nearly 10 years worked to increase the understanding of effects from low doses of ionizing radiation. In this arena, EPRI faces problems similar to those that EPA identifies, because the primary datasets of individualized data for human epidemiological studies of the atomic bomb survivors and workers at early production and utilization facilities are not readily available. These observational studies have been well-utilized and form the basis for radiation protection standards around the world (Ozasa et al., 2012; Richardson et al., 2015). The detailed data of the survivors of the atomic bombings of Hiroshima and Nagasaki are controlled by the Radiation Effects Research Foundation, and cannot be released to those outside of the Foundation under agreements with Japan and the United States. Similarly, studies of early cohorts of workers from the United States, England, France, and other countries are pooled and controlled by the International Agency for Research on Cancer. Since many of the data from human radiation studies are managed by other research organizations that have highly restrictive data access policies, it is unclear that special arrangements can be made with these entities to release the data for public access. EPRI is concerned that these seminal studies may be eliminated from future consideration as a result of this proposed rule.

2. **Dose-Response Models: Shape and Uncertainty:** The proposed rule states that EPA should give appropriate consideration to high-quality studies that explore a broad range of concentration-response modeling approaches, in addition to linearity. EPRI has been conducting research on different models and agrees that a variety of models should be applied to dose-response data, including linear, linear threshold, non-linear non-threshold, and non-linear threshold, with the objective to determine the best-fitting model. EPRI research on both hexavalent chromium and inorganic arsenic, for example, has suggested the presence of a threshold for the carcinogenicity of these trace metals (e.g., Thompson et al., 2015, 2017; Gentry et al., 2014; Efremenko et al., 2015). EPRI agrees that complete model fit statistics should be included in papers for transparency. However, it should be noted that "best fit" may not always be clear. For example, a common method of evaluating model fit is the Akaike Information Criterion (AIC). In some cases, the difference in the AIC

between models may be very small, which makes it challenging to determine which model truly represents the underlying data. In evaluating model fit, EPRI encourages the development and/or application of other methods so that consistency across approaches can be determined. However, regardless of the amount of information available on the best-fitting model for a particular dose-response relationship, there still may be some level of subjective judgement. The proposed rule should consider emphasizing the importance of conveying this judgment and associated uncertainty in a transparent manner.

It is also important that priority not be given to any particular dose-response model. The optimal dose-response curve should be dictated by the best available science and the degree of uncertainty present. The proposed rule states that EPA should incorporate the concept of model uncertainty; EPRI further suggests that studies should present uncertainty in the different model fits and that this information should be presented in a transparent manner. Further, uncertainties should be assessed both for the dose, and for the effect, so that a complete picture of uncertainties is presented. EPRI has supported the development of an Integrated Uncertainty Analysis (IUA) tool for air pollution risk assessment (Smith and Glasgow, 2017). This tool has the capability to comprehensively and simultaneously consider multiple sources of uncertainty in a given exposure-outcome relationship. Such a tool or approach could be useful in achieving the goal expressed in the proposed rule.

ISSUES AND QUESTIONS FOR CLARIFICATION:

1. **Timeliness of Public Access:** It is not clear whether *study validation/replication* would be required for consideration of any given research results in regulatory activities, or whether *data accessibility* is sufficient. A situation could be envisioned whereby a dataset is made publicly available just prior to a regulatory action/process component, e.g., publication of an Integrated Science Assessment for a NAAQS review. In this case, there may be a previously published study using these data, but insufficient time for another investigator to replicate the study methodology. It is not clear how this situation would be dealt with, i.e., whether the original study would then be excluded from the ISA. EPRI requests clarification of this issue.

2. **Costs Associated with Making Information Public:** It is unclear how the costs of obtaining data would be paid. For example, if researchers are required to expend significant effort and resources to deidentify datasets for dose-response modeling (which, as discussed above, is likely insufficient to fulfill the intent of the proposed rule in most cases), what recovery mechanisms would be in place to assist with the costs?

Would the federal government offer resources to assist with attempts to meet the new requirements for existing and future research efforts? Further, if data are purchased and then required to be shared (note that as discussed above, this is an unlikely scenario given privacy and confidentiality issues), will the original investigator be able to recoup costs associated with that purchase from subsequent researchers of the now-publicly available information? The additional costs associated with complying with the proposed rule may place an undue burden on research organizations and efforts such that research in these areas is not conducted at all to the detriment of the public. EPRI requests that the issue of funding for data accessibility be addressed.

3. **Use of Standardized Methodology:** The proposed rule states that EPA will utilize standardized test methods. It is not clear how new test methods or analytical methods would be factored into considerations. In some cases, new analytical approaches may not yet have reached the status of standard methods, but such techniques may be very informative in understanding the implications of data for use in a rulemaking. EPRI requests that EPA clarify that scientifically-grounded alternative testing methods and evaluations may be included in developing regulatory actions.

4. **Definition of "Data":** Section 30.5 of the proposed rule specifies the type of information that would be made public to allow independent validation. As discussed in some parts of Comment #1 above, the interpretation of the term "data" has critical implications. For complete independent validation and analysis, as stated in the proposed rule, the primary data record would be required. This could include, for example, raw death certificates and raw chemical monitoring data, both of which are subject to transcription error during creation of an analytical file, as well as, in the case of death certificates, challenges related to mortality coding. Notwithstanding privacy concerns, which is the subject of other portions of the proposed rule, public posting of these large quantities of data would be unwieldly. EPRI requests clarification of this issue.

5. **Independent Peer Review:** Section 30.7 of the proposed rule states that EPA shall conduct independent peer review of pivotal regulatory science. The proposed rule lacks any detail of this process, including selection criteria for peer reviewers, decision criteria, and how this compares to existing processes through the Science Advisory Board (SAB) and third-party contractor-managed peer reviews. EPRI requests clarification and additional detail related to this key provision of the proposed rule.

6. **Exemption Process:** Section 30.9 of the proposed rule states that the Administrator may grant exemptions on a case-by-case basis. While a reasonable exemption process could allow certain excluded research to be considered in regulatory proceedings, no detail is

provided regarding the process by and criteria under which such exemptions would be granted. EPRI requests clarification and additional detail related to this key provision of the proposed rule. EPRI also requests clarification and additional information on the process by which organizations or investigators can seek to resolve a situation where high quality scientific data/studies might be excluded.

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